Lars Andersson

Swedish Meteorological and Hydrological Institute
Oceanographic Laboratory

2013-12-08
Dnr: M/Gbg-2013-215

Report from SMHIs monitoring cruise November-December 2013

Survey area: The Baltic Proper and the Gulf of Bothnia
Survey period: 2013-11-29 to 2013-12-08
Vessel: KBV002 Triton

Principal: SMHI and Swedish Agency for Marine and Water Management

SUMMARY

The expedition, part of the Swedish regular marine monitoring programme, covered the Baltic Proper and the Gulf of Bothnia. Data presented in this report have been subject to preliminary quality control procedures only.

Nutrient levels were largely normal in the whole investigated area.
In the Baltic Proper, oxygen concentrations below 2 ml/l (hypoxia) were found at depths exceeding 70 to 80 metres, while a total deficiency of oxygen (anoxia) was found below 70 to 125 metres.
All parameters in the Gulf of Bothnia showed normal values and the oxygen conditions in the deep water were good.

The next expedition is planned for 16-19 December 2013, when the Skagerrak, Kattegat and the south-eastern Baltic Proper will be visited.

Address:
Sven Källfelts gata 15
SE-426 71 Vastra Frolunda
SWEDEN

Telephone:
+46 11 4958000
E-mail:
Lars.S.Andersson@smhi.se

E-mail data:
shark@smhi.se
WWW:
http://www.smhi.se/

SMHI

PRELIMINARY RESULTS

The cruise began in Oskarshamn on 29 November and ended in the same port on 8 December. A short port call was made in Slite on 5 Dec for a change of the ship's crew. Due to very bad weather, the storm named "Sven", stations BY10 and BCS III-10 had to be omitted, and at station BY15 no water sampling was possible, only CTD-profiling was performed. A formal mistake concerning the application to visit Finnish waters meant that three stations in Finnish territorial waters had to be excluded from the programme. Due to working environment concerns, no ammonia measurements were carried out. Winds during the expedition were moderate to hard, including very severe gale force winds. The air temperature varied between -2 and +4^{o}C.

The Baltic Proper

The temperature, as well as the salinity, in the surface layer showed normal values for the season and varied between 5.8-7.0°C and 6.6-6.9 psu, respectively. The surface layer was well mixed down to a depth of 40-50 meters. Nutrient concentrations in the surface layer were largely normal for the season, with the exception for phosphate exhibiting concentrations higher than normal in the Eastern Gotland Basin, and nitrite+nitrate being slightly lower than normal in the north and in the east. Phosphate concentrations in the surface water varied between 0.32 and 0.53 µmol/l. Concentrations of nitrite+nitrate were at 0.8 - 1.4 µmol/l, while the silicate concentrations varied between 8.7 and 11.4 µmol/l.

Hypoxia, oxygen concentrations lower than 2 ml/l, was found at depths exceeding 70 meters in the western and northern Gotland Basin and below 80 metres depth in the eastern Gotland Basin. Anoxic conditions, no oxygen but instead hydrogen sulphide present, were found at depths below 70-80 meters in the western parts and at depths exceeding 90-125 metres in the north and in the east.

The plankton activity, based on oxygen saturation and fluorescence, was low in the whole investigated area.

The Gulf of Bothnia

Surface temperatures in the Gulf of Bothnia were slightly above normal for the season. In the Bothnian Sea it varied between 2.9 and 5.2^{o}C, while in the Bothnian Bay it varied between 2.8 and 4.6^{o}C. The salinity in the surface layer of the Bothnian Sea was about 5.5 psu, while it in the Bothnian Bay was around 3 psu, which is normal.

In the surface layer all nutrients showed, all in all, normal values for this time of the year. Phosphate concentrations in the Bothnian Sea varied between 0.2 and 0.4 µmol/l, while in the Bothnian Bay it remained just below 0.1 µmol/l. Concentrations of inorganic nitrogen in the Bothnian Sea varied between 1.7 and 3.8 µmol/l, and in the Bothnian Bay between 4.9 and 6.1 µmol/l. Silicate concentrations of 13 to 24 µmol/l were measured in the Bothnian Sea while in the Bothnian Bay they were found to be around 37 µmol/l.

The lowest oxygen concentrations in the bottom water were detected at station F64, Solovjeva, in the Åland Sea, at 4.57 ml/l (corresponding to a saturation of 59%) and at station US2 (Ulvödjupet) in the northern part of the Bothnian Sea, at 4.91 ml/l (54% saturation). In the Bothnian Bay the water column was well mixed and no low oxygen values were reported.

Also in this area, plankton activity was low.

SMHI

PARTICIPANTS

Anna-Kerstin Thell	Cruise leader	SMHI Oceanographic laboratory
Lars Andersson		- ” -
Mikael Krysell		- ” -
Sari Sipilä		- ” -
Bengt Yhlen		- ” -

APPENDICES

Plots

Click on the button to open appendices. Note that this will only work when connected to Internet!

- Track chart
- Table over stations, parameters and sampling depths
- Map showing bottom water oxygen concentrations
- Profiles for selected stations
- Monthly average plots for selected stations